



*n*VIDIA®

GPUs for HPC

Company Highlights

- Fastest semiconductor co. to reach \$1 billion, \$2 billion
- Fortune Magazine: “100 Fastest Growing Companies”
- 18 quarters of operational profitability
- 64% desktop graphics market share
- Over \$1 billion in cash reserves
- Multiple brands, multiple markets
- Over 1700 employees



Technology

NVIDIA enhances the interactive visual experience on PCs, workstations, notebooks, handhelds and consoles.

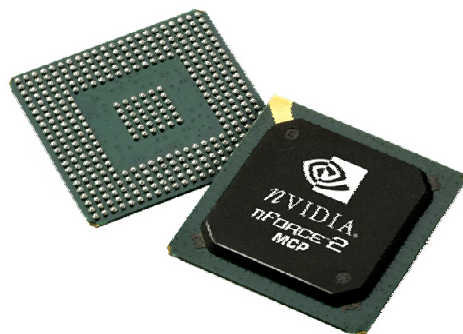
Graphics Processing Units

Graphics and Video Processing



Media Communications Processors

Network, Audio and Connectivity Processing



Platform Software

The Ultimate User Experience



World Class Engineering

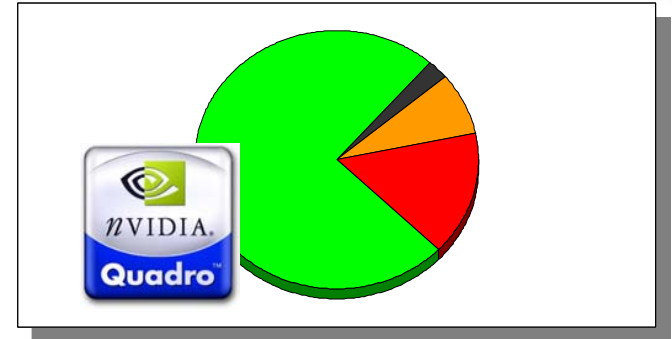
- 5000 man years in graphics, communications and software expertise
- Over 300 technology patents
- The Architects who built:
 - TNT, GeForce 1,2,3,4, and GeForceFX
 - Chief Architect of SGI Reality Engine
 - Chief Architect of SGI Infinite Reality
 - Chief Architect of Pixelflow
- Inventors of Anti-aliasing, Programmable Geometry, Pixel Shading, Occlusion Culling
- Founder, CTO or Chief Scientists from:
SGI, MasPar, 3DFX, Rendition, S3
- Previous experience from SGI, 3dfx, IBM, SUN, Evans & Sutherland, Pixel Flow, Intel, HP, Rendition, S3, Lockheed, Apollo, Cray, Stanford, Cal Tech, MIT...

NVIDIA Quadro

The Definition of Performance. The Standard for Quality.

● The Workstation Standard

Shipping in all WS OEMs
Wide Channel Presence



● Brand Leadership

Quadro FX
Quadro NVS
Quadro Go - Mobile WS
nForce3 Pro Opteron



● Recognized Quality

Image Quality
Application Certifications
Unified Driver Architecture



NVIDIA QuadroFX for every user



Quadro FX 3000G

- 256MB DDR
- Dual DVI
- Stereo Connector
- Framelock / Genlock



Quadro FX 3000

- 256MB DDR
- Dual DVI
- Stereo Connector



Quadro FX 2000

- 128MB DDR
- Dual DVI
- Stereo Connector



Quadro FX 1000

- 128MB DDR
- Dual DVI
- Stereo Connector



Quadro FX 500

- 128MB DDR
- VGA & DVI-I

**One Driver
Same Architecture
Scalable Performance
Linux and Windows**

Quadro FX Go700

- Dell Precision M60
- 128MB DDR
- 15.4" TFT FP

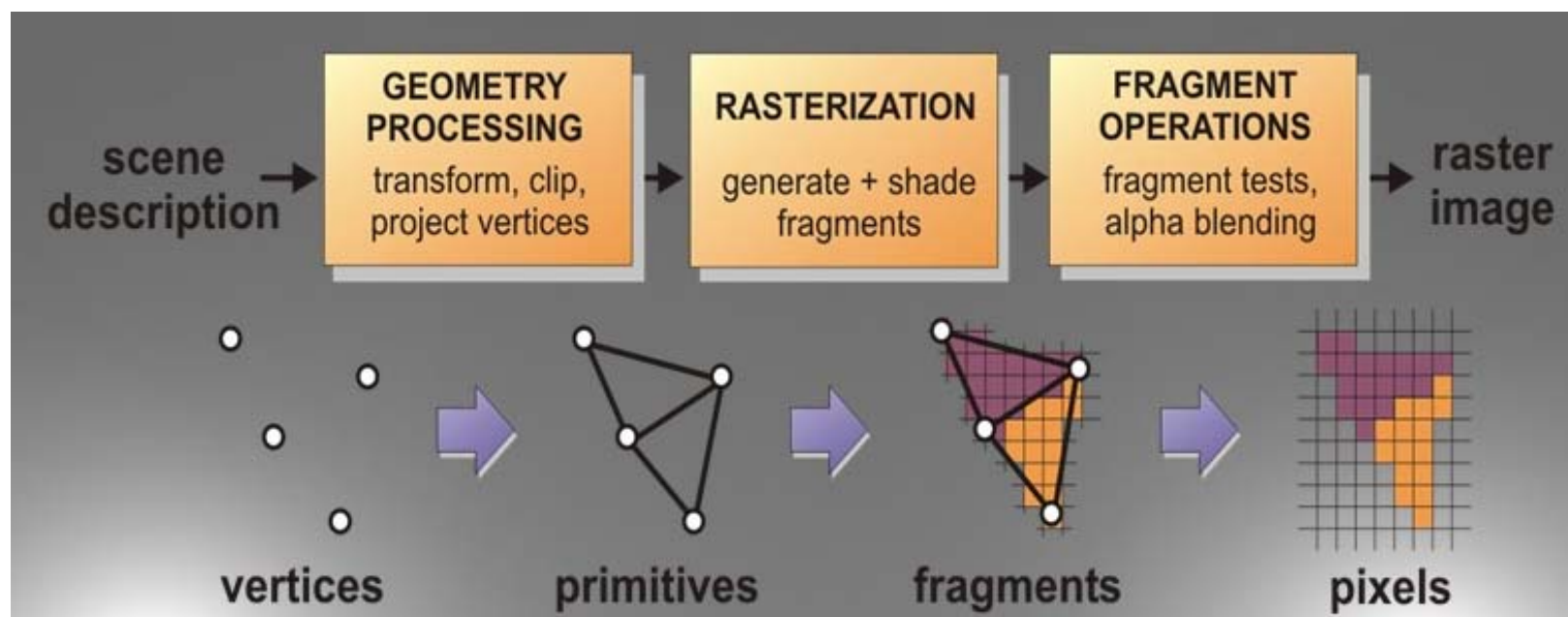


Its Coming. Brace Yourself.

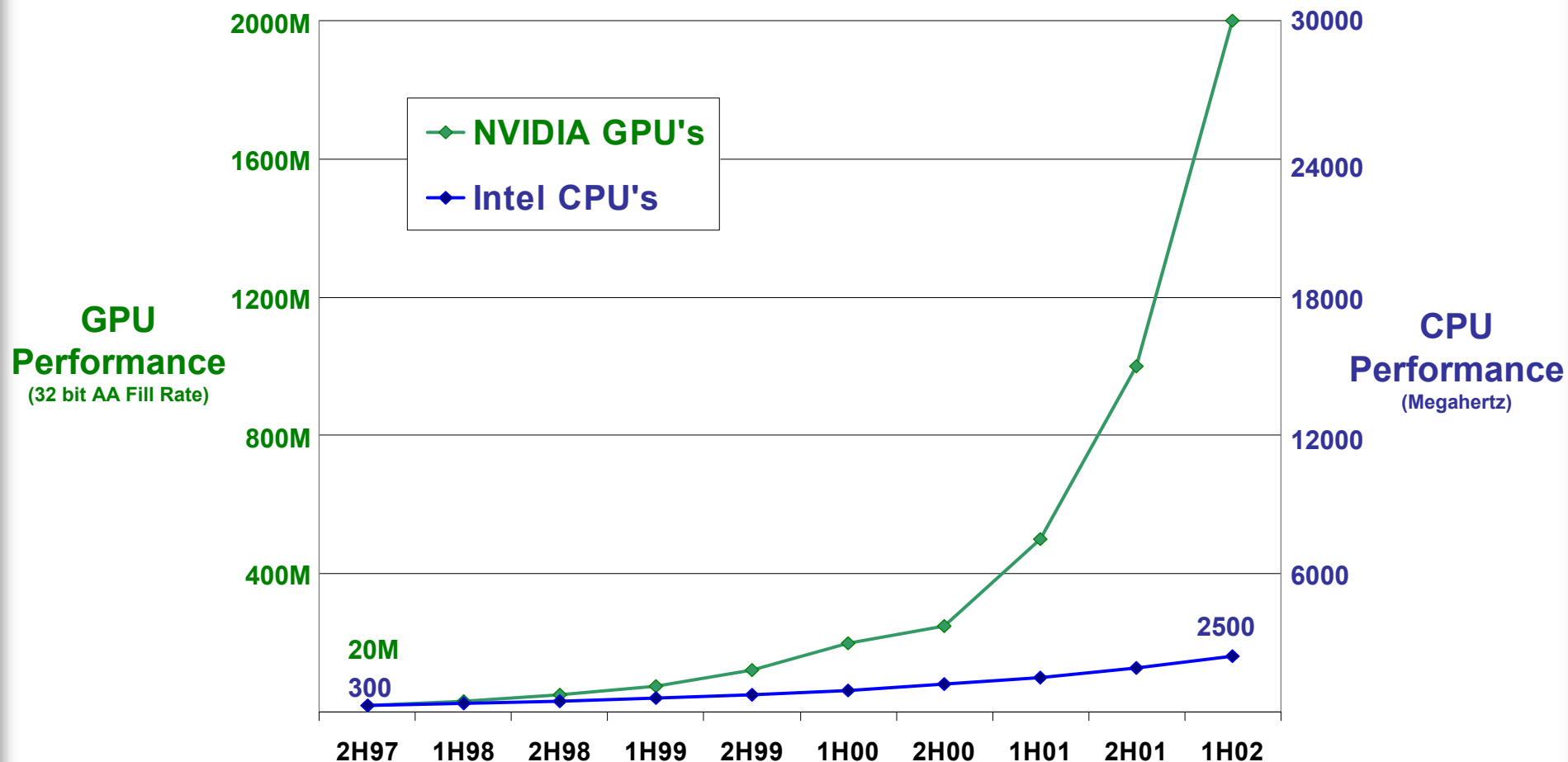
“The biggest revolution in graphics in ten years, and the foundation for the next ten.”

Kurt Akeley on NV30 & Hardware Rendering

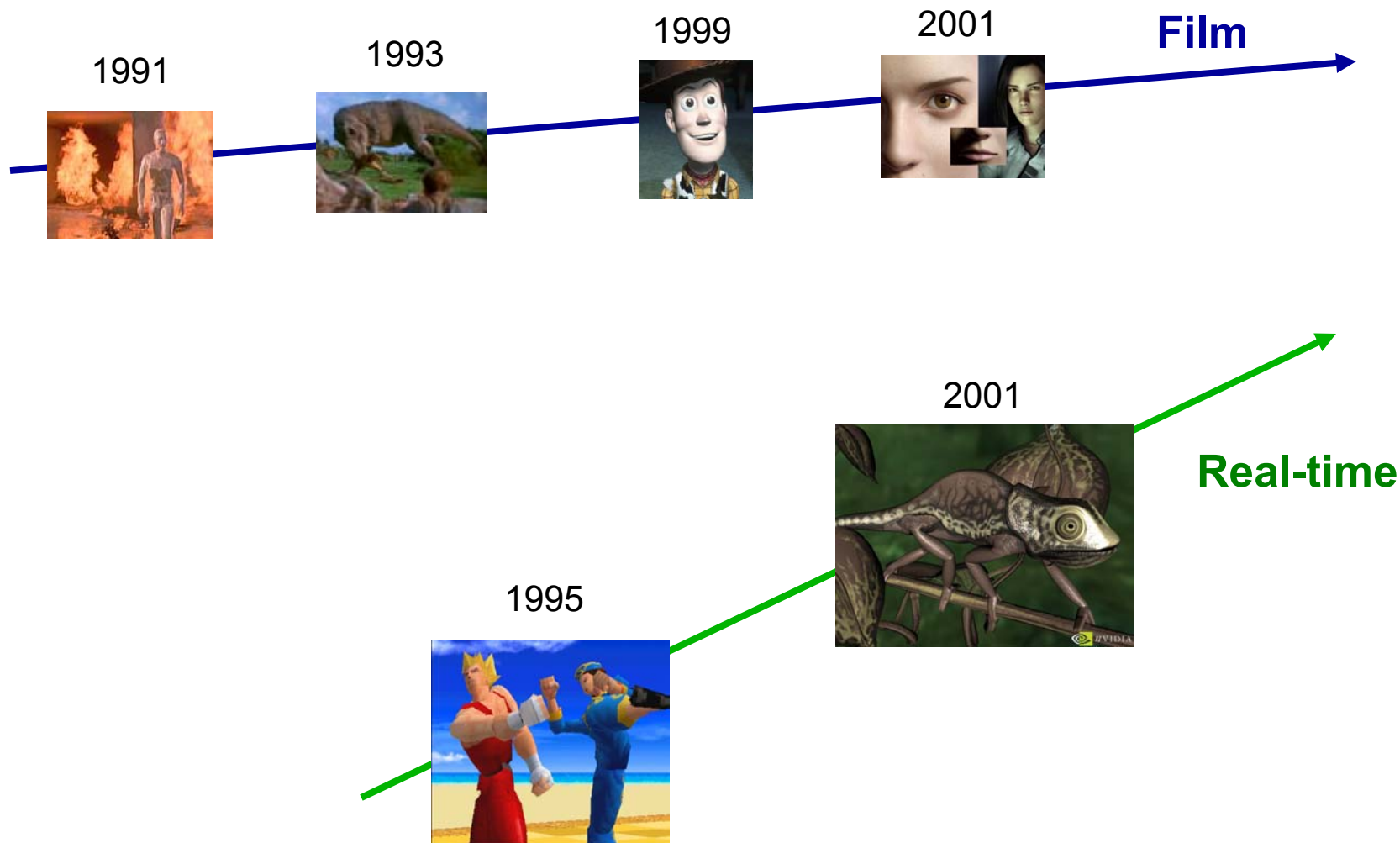
The Graphics Pipeline



NVIDIA – Moore's Law³



Convergence of Film and Real-time Rendering



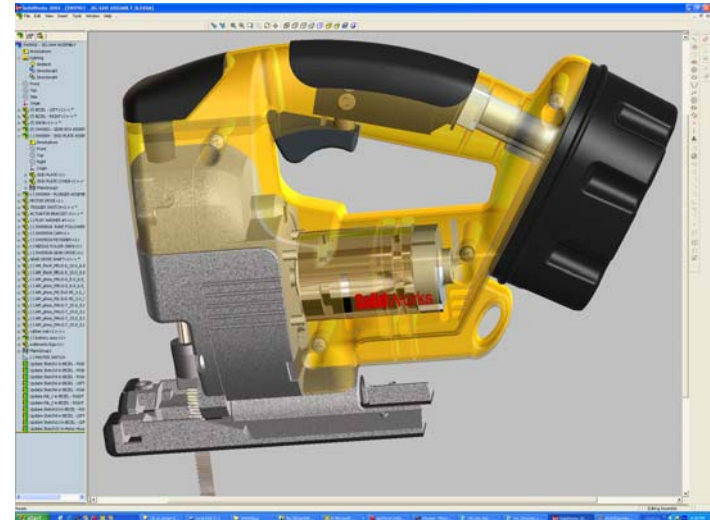
What is Shading?

- **Ultimate Control of Appearance**
- **Programmable**
 - Arbitrary computation
- **Procedural**
 - Simple procedures
 - High-level languages



Professional Usage

- Realistic Appearances
 - Styling
- Visualization
 - Data fields on surface
- Non-realistic appearance
 - Illustration



Application Trends

- **ISV application of GPU HW rendering**

- eg. DCC – Material Shaders
- eg. MCAD – Industrial Realism

- **Volume Rendering**

- Medical Imaging



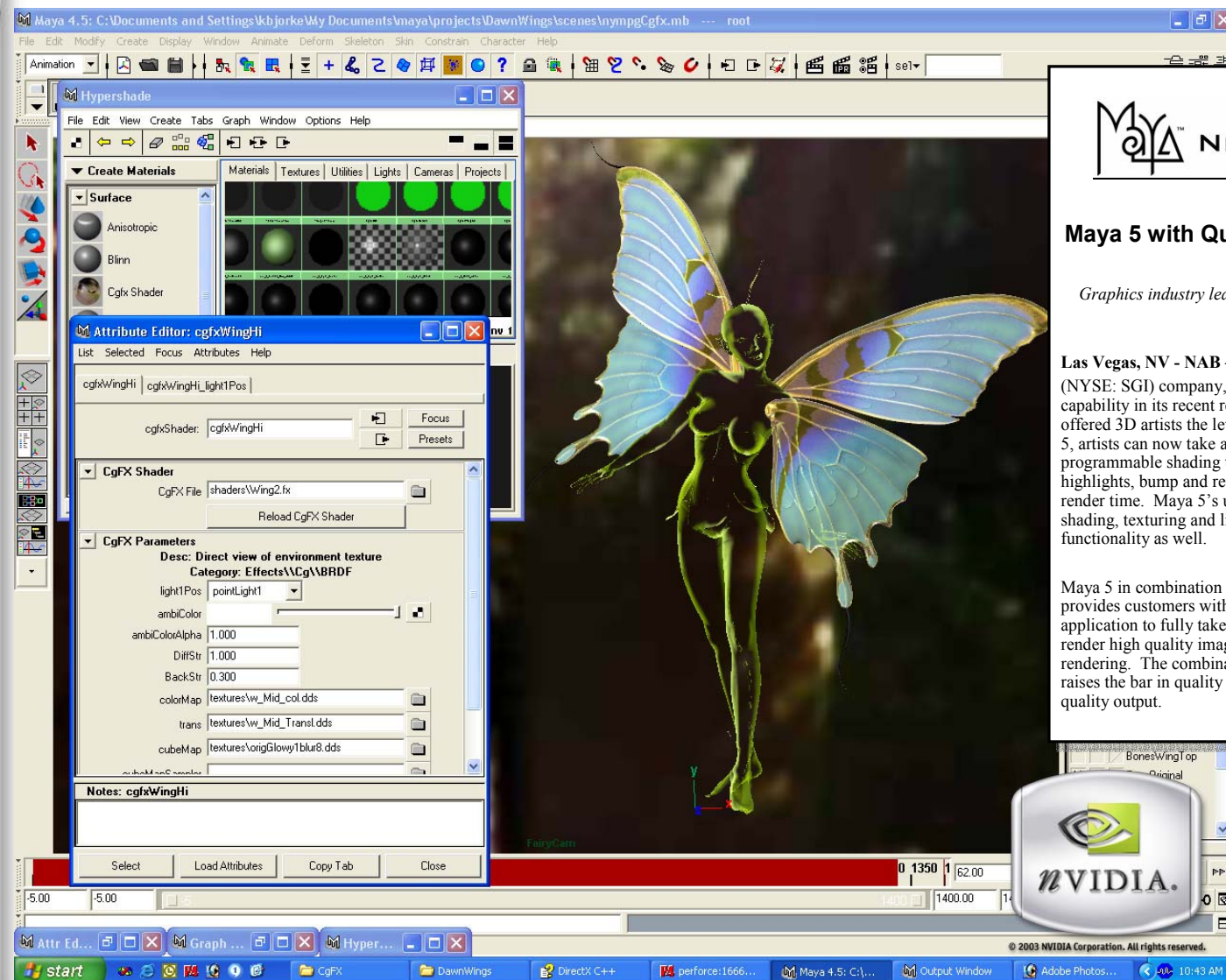
Figure 1: Time Series of a Cloud Scale Visualization

Courtesy Dr. David Ebert
Purdue University, PURPL

- **General Purpose**

- NV35 20GFLOPS = 10 GHz Pentium
- GPU as a Stream Processor
- <http://graphics.stanford.edu/~ianbuck/GH03-Brook.ppt>

Quadro FX - Digital Content Creation



Alias | wavefront®

Maya 5 with Quadro FX Smashes Rendering Barrier

Graphics industry leaders Alias|Wavefront and NVIDIA introduce Hardware rendering breakthrough

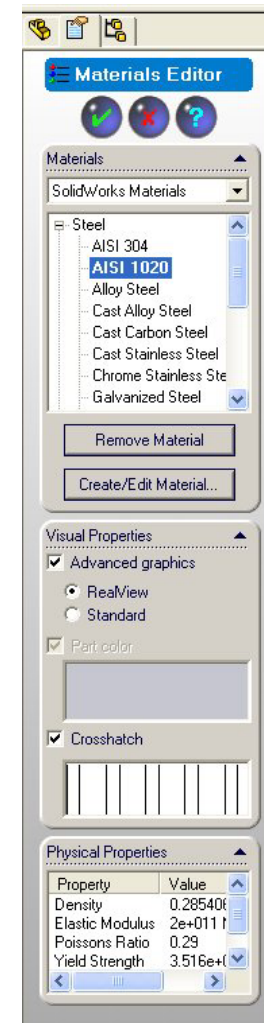
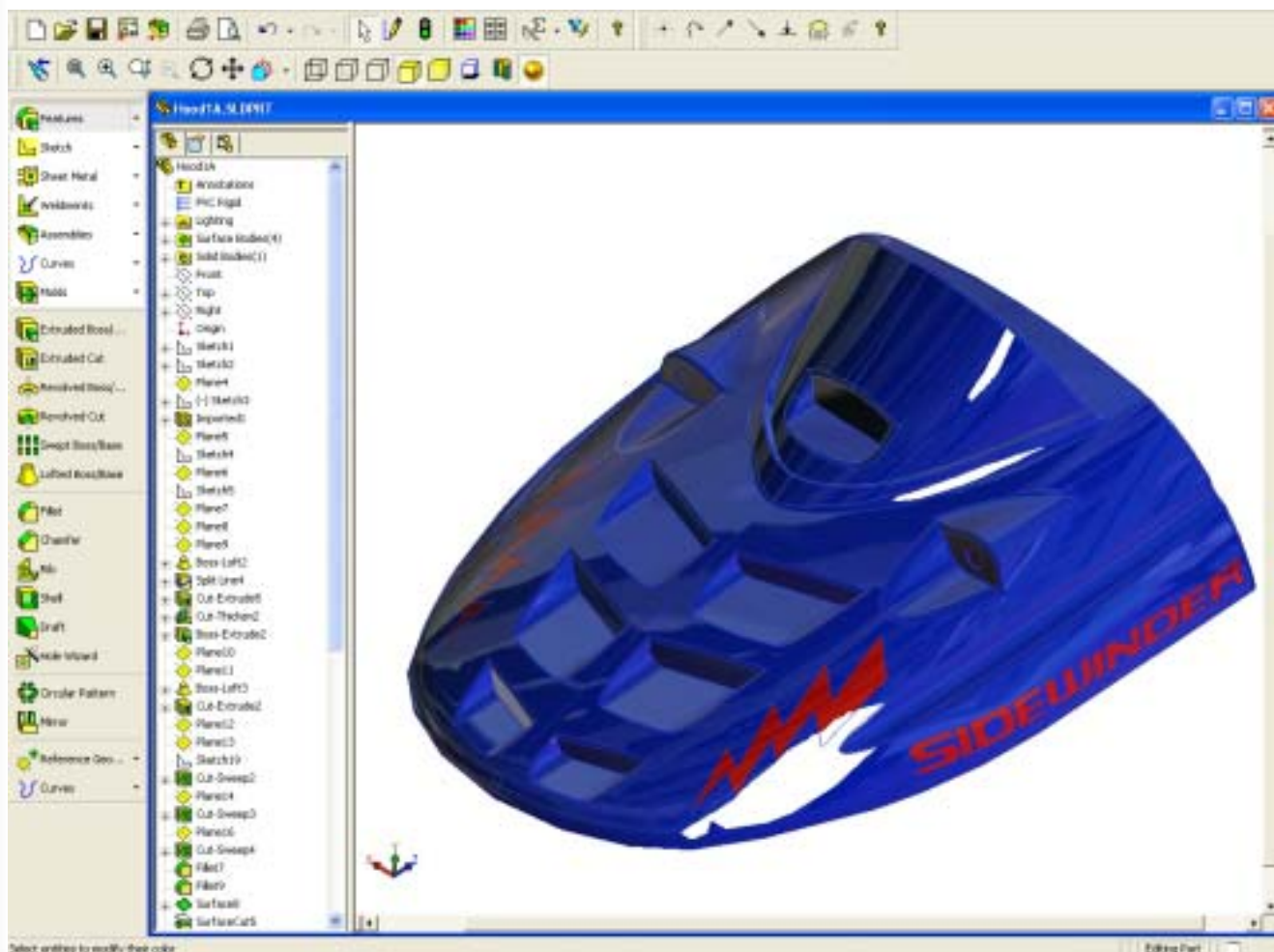
Las Vegas, NV - NAB – April 7, 2003 - Alias|Wavefront™, an SGI (NYSE: SGI) company, revealed today an innovative Hardware rendering capability in its recent release of Maya® 5. Until now, only Software rendering offered 3D artists the level of quality required for final image output. With Maya 5, artists can now take advantage of advances in per vertex and per pixel programmable shading technology to render quality images with specular highlights, bump and reflection mapping and shadows, at a fraction of traditional render time. Maya 5's unified rendering workflow significantly simplifies shading, texturing and lighting allowing non-technical artists to benefit from this functionality as well.

Maya 5 in combination with NVIDIA's new Quadro® FX graphics engine - provides customers with unprecedented rendering power. Maya 5 is the first 3D application to fully take advantage of the Quadro FX's power and precision to render high quality images that in many cases are indistinguishable from Software rendering. The combination of Maya 5 and advanced graphics card technology raises the bar in quality for pre-visualization and boosts speed for broadcast quality output.



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Quadro FX - MCAD



Quadro FX for Volume Rendering

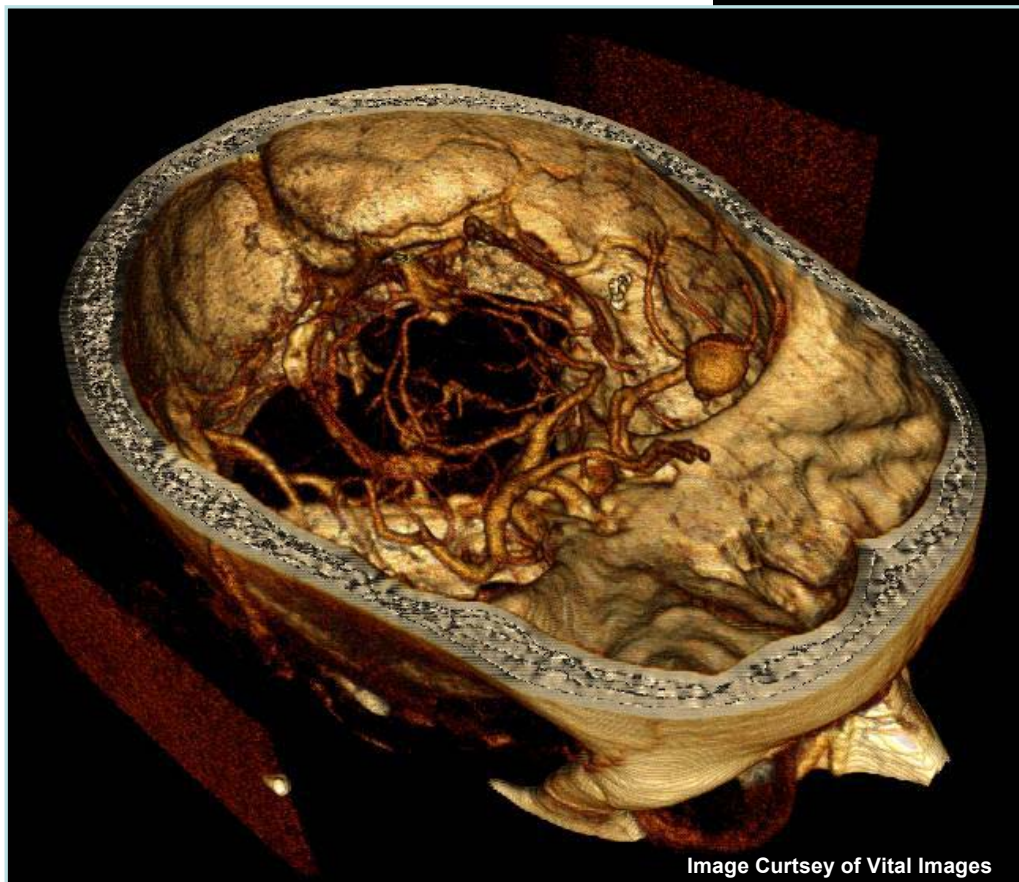


Image Courtesy of Vital Images

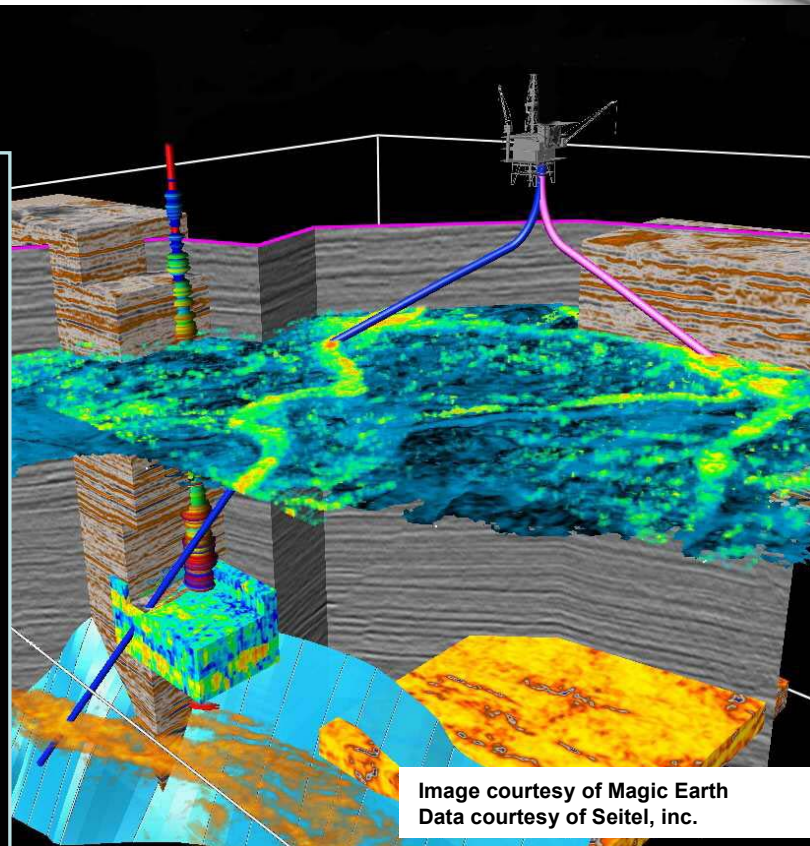
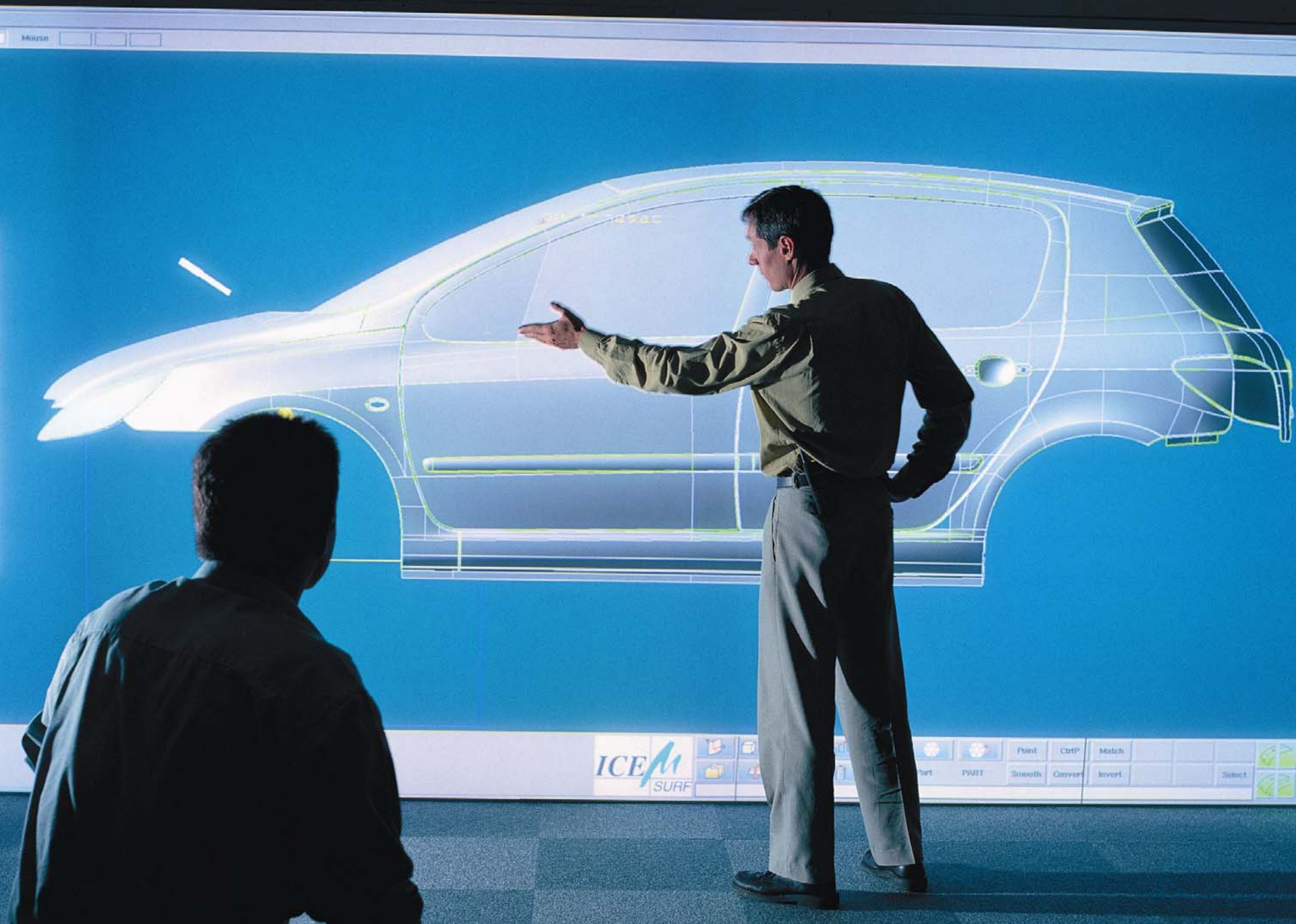


Image courtesy of Magic Earth
Data courtesy of Seitel, inc.



Mouse

ICE
SURF

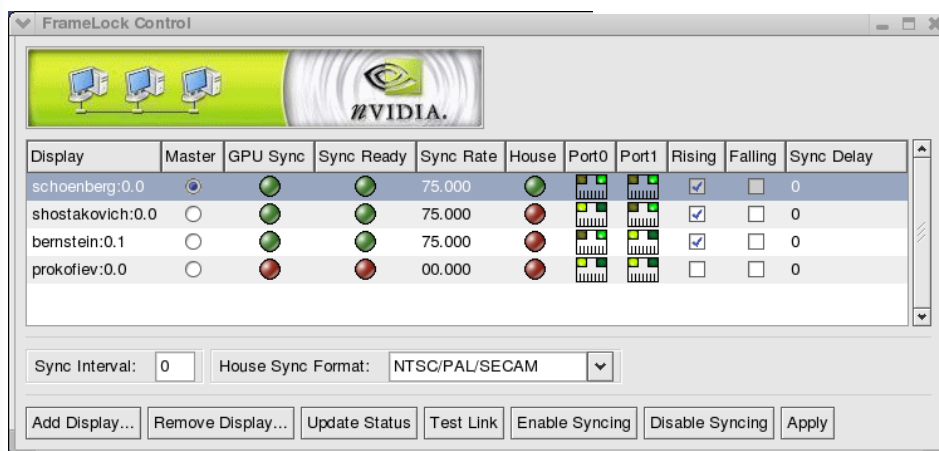
Part PSWT Point CtrlP Match Smooth Convert Invert Select

NVIDIA Quadro FX 3000G

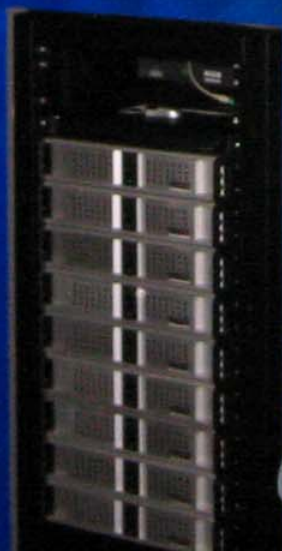


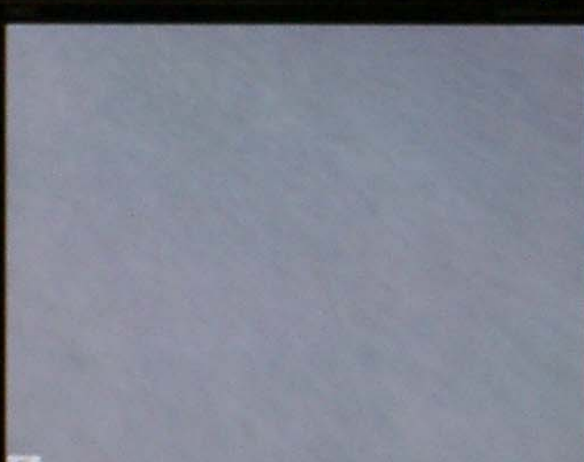
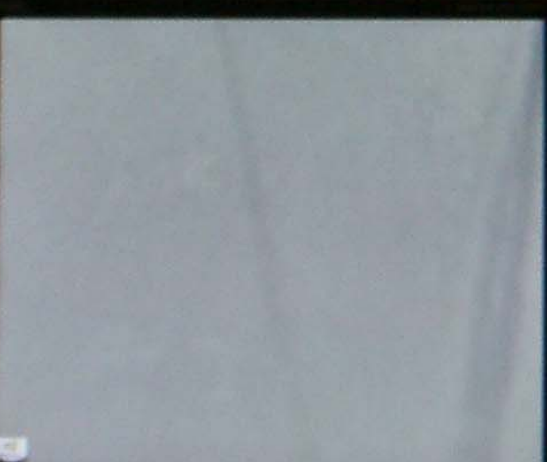
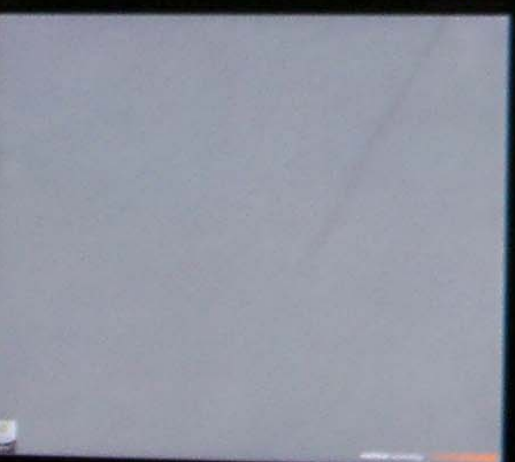
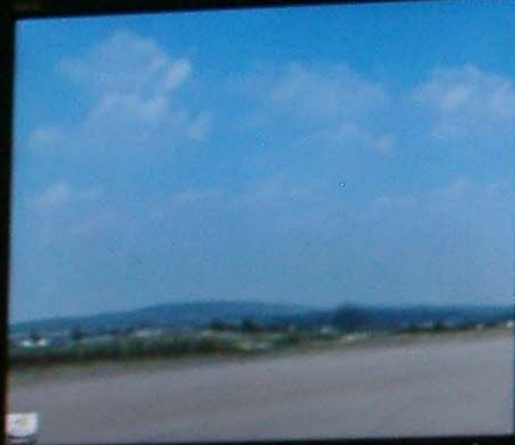
FrameLock

Genlock

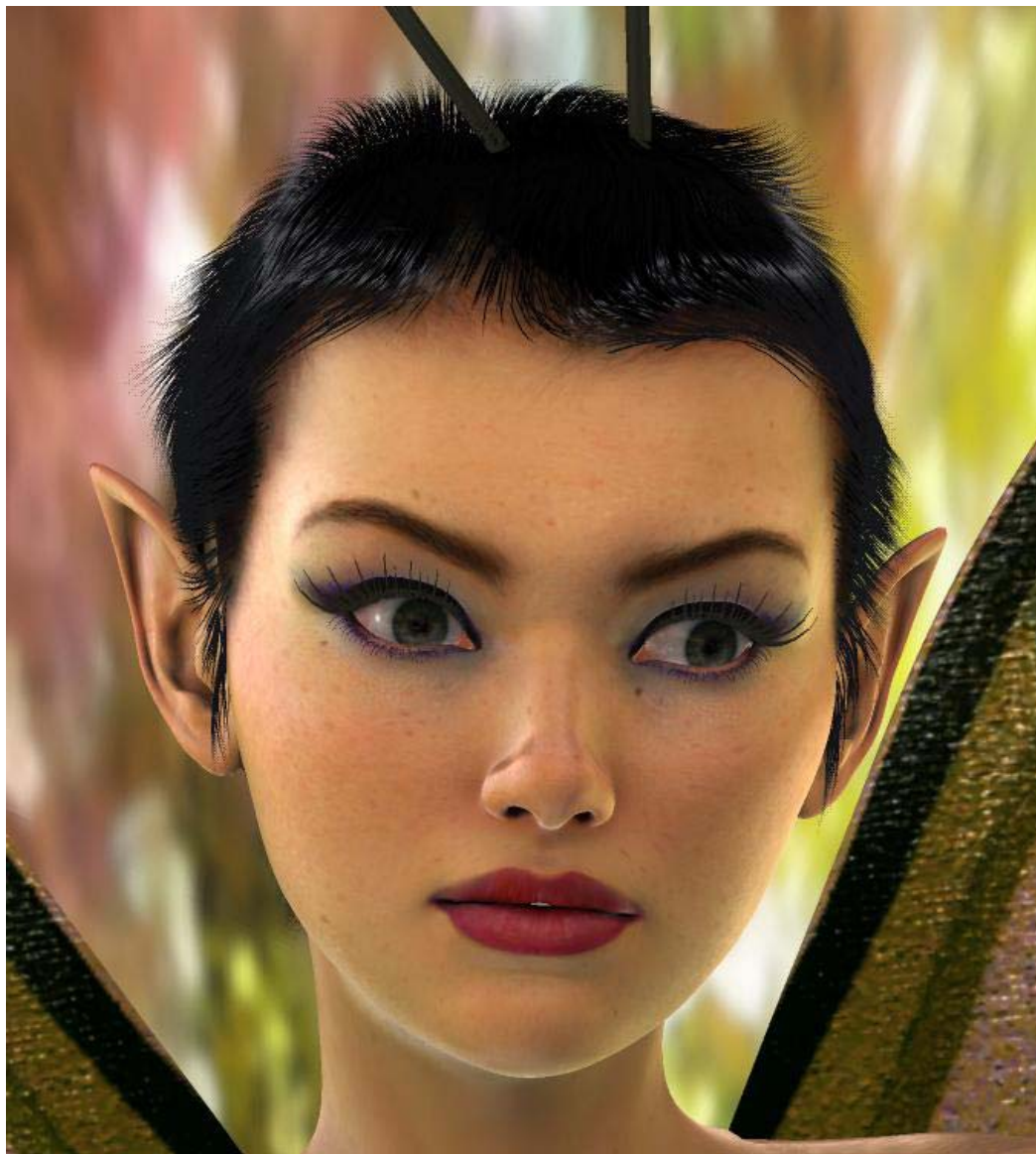


POWERING ADVANCED VISUALIZATION





Current Real Time State of the Art



Real Time Target



Soft shadows

Realistic hair

Displacement
mapping

Skin shader

Depth of field